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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/302,762	04/30/1999	ASHOK N. RUDRAPATNA	113349	7375

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EXAMINER

DUONG, FRANK

ART UNIT

PAPER NUMBER

2664

DATE MAILED: 03/12/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Jey

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	09/302,762	RUDRAPATNA, ASHOK N.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Frank Duong	2664	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1) ☒ Responsive to communication(s) filed on 30 April 1999.

2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4) ☒ Claim(s) 1-25 is/are pending in the application.

4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.

6) ☒ Claim(s) 1-5, 7 and 10-21 is/are rejected.

7) ☐ Claim(s) 6, 8, 9 and 22-25 is/are objected to.

8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

9) ☐ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on 30 April 1999 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☐ All   b) ☐ Some \*   c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.

3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____.
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>2</u> .	6) <input type="checkbox"/> Other: _____.

U.S. Patent and Trademark Office                      Office Action Summary                      Part of Paper No. 4  
PTO-326 (Rev. 04-01)

### **DETAILED ACTION**

1. This Office Action is a response to the communication dated 04/30/1999. Claims 1-25 are pending in the application.

#### ***Information Disclosure Statement***

2. The information disclosure statement filed 04/30/1999 complies with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609. It has been considered and placed in the application file.

#### ***Drawings***

3. The drawings are objected to because there is an inconsistency in the drawings. The inconsistency is that the original drawings filed 04/30/1999 missing figure 3 and the formal drawings, accompanied the Letter to the Official Draftperson, filed 11/22/1999 missing figure 4. In the above formal drawings, figures 1-2 are corresponding to Figures 1-2 of the original drawings. However, figure 4 of the original drawings is somehow become figure 3 of the above formal drawings. In the specification, page 12, line 14 and thereafter, it is described figure 3 of the original drawings, not figure 3 of the formal drawings. Thus, Applicant is required to correct the above inconsistency in the drawings.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

4. Claims 1-5 and 10-21 are rejected under 35 U.S.C. 102(e) as being anticipated by Sherman (USP 5,878,037).

In according to Figures 1-6 and the description at col. 3, line 22 to col. 8, line 41, Sherman discloses a satellite communication system (*Figure 1*) which implements code division switching at an intermediate frequency range using both narrowband user traffic codes and wideband cover codes to improve beam processing. The on-board switching of Sherman's invention is performed on an individual beam basis, rather than on the individual user signal basis of conventional switching methods. As a result, on-board equipment as well as costs can be greatly reduced. The recitation thereat reads on the claimed communication system as corresponding below.

Regarding claim 1, the claim calls for a communication system (Figure 1) comprising:

transmission equipment (*corresponding to figure 1, elements 104*) that is assigned to a particular origination path (*corresponding to figure 2, User Data having traffic code  $T(N)$  and cover code  $C(N)$  associated with a particular Uplink Beam Signal  $N$  or just Uplink Beam Signal  $N$* ), encodes (*corresponding to figure 2, Mixers 202 and 204*) user signals (*figure 2, User Data*) originating at or near the transmission equipment based on the origination path (*Uplink Beam Signal  $N$* ) and a particular destination path (*Downlink Beam Signal  $N$* ), and transmits (*corresponding to figure 2, elements 206 and 208*) the encoded user signals (*corresponding to Wideband Signals*) on the particular origination path (*note: in reference to figure 1 and the description at col. 3, lines 62-64, Sherman discloses communications system 100 comprises satellite 102 and a multitude of users 104. In reference to figure 2 and the description at col. 4, lines 50-67, Sherman discloses user equipment comprising, among other things, a Mixer 202 acts as a modulator by mixing the user data with a narrowband traffic code  $T(i)$  and a Mixer 204 acts as a spreader by mixing the narrowband signal generated by Mixer 202 with a wideband spreading cover code  $C(j)$  to generate a wideband signal. At col. 5, lines 1-4, Sherman further discloses upconverter, in user equipment 104, upconverts the wideband signal from IF to an appropriate RF range for transmission by antenna 208 to satellite 102 of figure 1 within one of the uplink signal beams*);

switching equipment (*corresponding to figures 1 and 3, element 102*) that receives (*corresponding to figure 3, element 302*) the encoded user signals on the

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particular origination path, routes (corresponding to figure 3, outputs of element 302) the encoded user signals at a path level (corresponding to beam level), and transmits (corresponding to figure 3, element 304) the encoded user signals on the particular destination path (corresponding to Downlink Beam N) (note: in reference to figures 3-5 and the description at col. 5, line 50 to col. 7, line 53, Sherman discloses the block diagram of the switching processing implemented by the satellite 102 of figure 1. Satellite 102 comprises, among other things, an uplink processor 302 and downlink processor 304. Uplink processor 302 receives all of the user signals in the corresponding uplink signal beams and processes those signals to direct them to the appropriate downlink signal beams. The uplink processing involves downconverting the received RF signals to IF, removing the cover code for each uplink signal beam to reveal the underlying narrowband user signals, and filtering the narrowband user signals to isolate and route particular user signals to particular downlink processors. On the other hand, the downlink processor 304 receives the narrowband user signals from the various uplink processors 302 and processes those user signals for transmission in the corresponding downlink signal beam to include summing all of the user signals for the particular downlink signal beam; reapplying an appropriate cover code to the summed signals to generate a wideband signal uniquely associated with the particular downlink signal beam; and upconverting the wideband signal from IF to RF for transmission. In doing so, at col. 3, lines 49-52, the on-board switching is performed on a beam level, rather than on the individual user signal level as the conventional switching methods); and

reception equipment (*corresponding to figure 6, element 104*) that is assigned to the particular destination path (*corresponding to figure 3, Downlink Beam N or figure 6, RF signal From Satellite*), receives (*corresponding to figure 6, element 602*) the encoded user signals on the particular destination path (*Downlink Beam N*), and decodes (*corresponding to figure 6, element 604*) the user signals (*note: in reference to figure 6 and the description at col. 7, line 54 to col. 8, line 14, Sherman discloses a block diagram of the downlink processing implemented by each user 104 of figure 1. Each user 104 comprises, among other things, downconverter 602, mixer 604 for receiving, downconverting and decoding a particular user signal based on the encoded wideband cover code and narrowband traffic code to distinguish between individual downlink signal beams and individual user signals within a downlink signal beam*).

Thus, Sherman discloses the claimed invention in a manner set forth as claimed.

Regarding claim 2, in addition to the features of the base claim 1 (*see rationales pertaining the rejection of base claim 1 discussed above*), the claim calls for wherein the particular origination path is a particular origination beam (*corresponding to figure 3, Uplink Signal Beam N*) and the particular destination path is a particular destination beam (*corresponding to figure 3, Downlink Beam N*) and the switching equipment (*corresponding to figure 3, element 102*) routes the encoded user signals at a beam level (*note: at col. 5, lines 63-64, in reference to figure 3, Sherman discloses the uplink processing involves, among other things, routing particular user signals to particular downlink processors. At col. 3, lines 49-52, the on-board switching is performed on a*

*beam level, rather than on the individual user signal level as the conventional switching methods).*

Thus, the recitation thereat reads on the claimed limitations in a manner set forth as claimed.

Regarding claim 3, in addition to the features of the base claim 1 (*see rationales pertaining the rejection of base claim 1 discussed above*), the claim calls for wherein the switching equipment is located on a satellite and the transmitting and reception equipment are ground-based (*see col. 3, lines 38-47*).

Regarding claim 4, in addition to the features of the base claim 1 (*see rationales pertaining the rejection of base claim 1 discussed above*), the claim calls for wherein the transmission equipment is assigned to a particular origination path based on geographic location (*corresponding to Coverage Area N*). (*see col. 4, lines 22-24*).

Regarding claim 5, in addition to the features of the base claim 1 (*see rationales pertaining the rejection of base claim 1 discussed above*), the claim calls for wherein the reception equipment is assigned to a particular destination path based on geographic location (*corresponding to Coverage Area N*) (*see col. 4, lines 26-28*).

Regarding claim 10, in addition to the features of the base claim 1 (*see rationales pertaining the rejection of base claim 1 discussed above*), the claim calls for wherein the switching equipment determines to which destination path an encoded user signal is destined (*note: at col. 5, lines 50-64, Sherman discloses the uplink processor 302, in satellite 102, performs processing, among other functions, to include routing particular user signals to particular downlink processors. At col. 6, lines 7-9, Sherman further*



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*discloses satellite 102 acts as a signal relay that performs the switching function that directs each received user signal to the appropriate destination).*

Regarding claim 11, in addition to the features of the base claim 1 (*see rationales pertaining the rejection of base claim 1 discussed above*), the claim calls for wherein the switching equipment is located on satellite (*see figure 3, col. 5, lines 50-52*);

the transmission equipment encodes user signals and transmits the encoded user signals to the satellite via the origination path (*see figure 2, col. 5, lines 5-20*);

the reception equipment receives the encoded user signals from the switching equipment on the satellite via the destination path (*see figure 6, col. 7, line 54 to col. 8, line 14*).

Regarding claim 12, in addition to the features of the base claim 1 (*see rationales pertaining the rejection of base claim 1 discussed above*), the claim calls for wherein the transmission equipment encodes user signals from a plurality of users and transmits the encoded user signals to a satellite via the origination path (*see figure 3, col. 5, line 50 to col. 6, line 9*).

Regarding claim 13, in addition to the features of the base claim 1 (*see rationales pertaining the rejection of base claim 1 discussed above*), the claim calls for where the reception equipment receives the encoded user signals from the switching equipment on the satellite via the destination path, decodes the encoded user signals, and distributes the decoded user signals to at least one receiving user (*see figure 6, col. 7, line 54 to col. 8, line 14*).

Regarding claim 14, in addition to the features of the base claim 1 (*see rationales pertaining the rejection of base claim 1 discussed above*), the claim calls for wherein routing information (corresponding to reapplied cover code, col. 6, line 3) is encoded in the user signals transmitted by the transmission equipment (*see figure 3, col. 5, line 65 to col. 6, line 9, wherein Sherman discloses the downlink processor 304 receives the narrowband user signals form various uplink processors 302 and processes those users signals involving, among other functions, reapplying an appropriate cover code to the summed signals to generate a wideband signal uniquely associated with the particular downlink signal beam for transmitting to the appropriate destination*).

Regarding claim 15, in addition to the features of the base claim 1 (*see rationales pertaining the rejection of base claim 1 discussed above*), the claim calls for wherein the switching equipment uses the routing information (*corresponding to cover code*) to route the encoded user signals to the destination path (*see figure 3, col. 5, lines 50-64, wherein Sherman discloses uplink processor 302 receives all of the user signals in the corresponding uplink beam and processes those signals involving, among other functions, removing the cover code for each uplink signal beam, filtering to isolate and route particular user signals to particular downlink processors for processing and transmitting to the appropriate destination*).

Regarding claim 16, in addition to the features of the base claim 1 (*see rationales pertaining the rejection of base claim 1 discussed above*), the claim calls for wherein the transmitting and reception equipment use a spread spectrum technique to transmit the encoded user signals (*see col. 3, lines 38-47*).

Regarding claim 17, in addition to the features of the base claim 1 (see *rationales pertaining the rejection of base claim 1 discussed above*), the claim calls for wherein the switching equipment determines the origination path and destination path of an encoded user signal based on unique path-specific information (see *col. 3, lines 49-54 and figure 3, col. 5, lines 55-64*).

Regarding claim 18, the claim calls for a communication method (see *figures 1-6, col. 3, line 21 to col. 8, line 14*) comprising:

assigning transmission equipment (*corresponding to figure 2, user 104, col. 3, lines 65-66*) to a particular origination path (*corresponding to figure 2, User Data having traffic code  $T(n)$  and cover code  $C(n)$  associated with a particular Uplink Beam Signal  $N$* ) (see figure 2);

encoding (*corresponding to Mixers 202 and 204*) user signals (figure 2, User Data) based on the origination path (*corresponding to narrowband traffic code  $T(i)$* ) and a particular destination path (*corresponding to wideband spreading cover code  $C(j)$* ) (see figure 2, *col. 4, lines 50-67*);

transmitting (*corresponding to upconverter 206 and antenna 208*) the encoded, user signals (*figure 2, Wideband Signals*) on the particular origination path (see figure 2, *col. 5, lines 2-4*);

receiving (*corresponding to uplink processor 302*) the encoded, user signals on the particular origination path (see *figures 3-4, col. 5, line 55 to col. 6, line 49*);

routing (see *figure 3, col. 5, lines 59-64*) the encoded, user signals at a path level (*corresponding to beam basis, col. 3, lines 49-54*);

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transmitting (*corresponding to downlink processor 304*) the encoded, user signals on the particular destination path (see figures 3 and 5, col. 6, lines 50-67);

receiving (*corresponding to downconverter 602*) the encoded, user signals on the particular destination path (see figure 6, col. 7, line 66 to col. 8, line 6); and

decoding (*corresponding to Mixer 604*) the encoded, user signals (see figure 6, col. 8, lines 7-14).

Regarding claim 19, in addition to the features of the base claim 18 (see *rationales pertaining the rejection of base claim 18 discussed above*), the claim calls for wherein the particular origination path (*corresponding to User Data having traffic code  $T(N)$  and cover code  $C(N)$  at the originating end*) is an origination beam (*corresponding to Uplink Signal Beam  $N$* ) and the particular destination path (*corresponding to User Data having traffic code  $T(N)$  and cover code  $C(N)$  at the receiving end*) is a destination beam (*corresponding to Downlink Signal Beam  $N$* ) (see col. 4, lines 22-29).

Regarding claim 20, in addition to the features of the base claim 19 (see *rationales pertaining the rejection of base claim 19 discussed above*), the claim calls for wherein routing (see figures 3-5, col. 5, line 50 to col. 6, line 67) is performed based on beam code (corresponding to cover code  $C(N)$ ) encoded in the encoded, user signals (*corresponding to Wideband Signals*).

Regarding claim 21, in addition to the features of the base claim 20 (see *rationales pertaining the rejection of base claim 20 discussed above*), the claim calls for wherein encoding the encoded, user signals encodes the user signals with beam codes (*corresponding to traffic codes  $T(N)$  at the originating end 104*) associated with the

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particular origination beam (*corresponding to Uplink Signal Beam N*) and beam codes (*corresponding to cover codes C(N) at the originating end 104*) associated with the particular destination beam (*corresponding to Downlink Signal Beam N*) (see figure 2, col. 4, line 44 to col. 5, line 49).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sherman in view of obviousness.

Regarding claim 7, in addition to the features of the base claim 1 (*see rationales pertaining the rejection of base claim 1 discussed above*), the claim calls for wherein the origination or reception equipment is mobile. Sherman fails to explicitly disclose wherein the origination or reception equipment is mobile. However, at col. 6, lines 7-8, Sherman discloses the communications system 100 may support telephone communications between users 104, and at col. 8, lines 39-40, Sherman also discloses the present invention can be applied to wireless network that uses spread spectrum technology. Therefore, it is obvious to a skilled artisan to contemplate the origination or reception equipment, user 104 of Sherman's invention, is mobile.

***Allowable Subject Matter***

6. Claims 6, 8-9 and 22-25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

On-board processing/switching equipment, routing encoded, user signals on a beam level, that has a controller dynamically re-routes the encoded user signals received from the originating ends to a conventional on-board processing/switching equipment that processes and re-routes encoded, user signals at a user level, in the event that the beam number of origination and destination satellite beams exceed the number of system users by a predetermined threshold causing a predetermined system condition to occur, is deemed to be novel.

7. The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record, considered individually or in combination, fails to fairly show or suggest the claimed communication system/method comprises the claimed elements/steps functionally and structurally interconnected in a manner set forth as claimed in base claims 1 and 18 and further comprises a controller/re-routing step that dynamically re-routes the encoded user signals received from the originating ends to a conventional on-board processing/switching equipment that processes and re-route encoded, user signals at a user level, in the event that the beam number of origination and destination satellite beams exceed the number of system users by a predetermined threshold causing a predetermined system condition to occur in a manner set forth as claimed in the independent claims 8, 8-9 and 22-25.

***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Ibanez-Meier et al. (USP 6,144,654).

Haber (USP 6,081,531).

Erving et al (USP 5,815,527).

Berner et al, MOBS – A Modular On-Board Switching System, IEEE, pages 1769-1773, 1988.

Jolfaei et al, Concept of On-Board-Processing Satellites, IEEE, pages 391-394, 1992.

Hager, High Speed On-Board Processing and Switching, IEEE, pages 229-234, 1993.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Frank Duong whose telephone number is (703) 308-5428. The examiner can normally be reached on 7:00AM-3:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wellington Chin can be reached on (703) 305-4366. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9314 for regular communications and (703) 872-9314 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4700.



Frank Duong  
March 6, 2002